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ABSTRACT

Arguing that many new ideas, techniques, and products fail to be adopted because they are not properly linked to the needs of knowledge users, this chapter presents an approach to the problem of linking the knowledge user with the knowledge producer that is designed to provide linkage agents with a frame of reference and tools for disciplined inquiry. The approach uses a programmatic effort covering several studies that employ the Wolf-Welsh Linkage Methodology (WWLM) and the Wolf Knowledge Diffusion/Utilization Inventory (WKD/UI). The paper begins by reviewing the literature of knowledge diffusion and utilization. The development of the WWLM using Hutchinson's metamethodology is then described, as well as the development of the WKD/UI. Studies using both processes are detailed. Finally, the use of the methodology and the inventory by linkage agents is described. One figure and two appendixes describing the WWLM and WKD/UI are included. (23 references) (Author/EW)

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Chapter 29

Linking Knowledge Production and Needs of Knowledge Users

W.C. Wolf, Jr.

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Most new ideas, new techniques, new products fail due to lack of adoption. Why do "good" ideas often suffer the fate of nonacceptance? Probably because the new knowledge which is produced is not properly linked to the needs of knowledge users. This chapter provides a look at the problem just described, analyzes why failures occur and provides approaches for solving the problem through the Wolf-Welsh Linkage Methodology and the Wolf Knowledge Diffusion/Utilization Inventory.

INTRODUCTION

Someone, somewhere can be counted upon to come up with a new product, a new way to do routine tasks, or a new idea, which purportedly will improve the practice of individuals in some useful manner. Count upon the regular disappearance of the bulk of these innovations as well. What has been conceived in earnest all too often flops fast. Unfortunately, well-conceived and developed innovations flop at about the same rate as do ill-conceived ones.

"Linkage agents" routinely sift through mounds of new practices, products, and ideas, in order to determine which ones best meet the needs of targeted audiences. Their preferences can determine the effective life-span of innovations. Linkage agents, either inadvertently or deliberately, thus become "information gate-keepers" for their respective disciplines. Their selection of specific seeds, drugs, instructional materials, or mass media messages, for example, can have profound consequences.

Selection is only one aspect of their potential influence. It is not unreasonable to believe that skilled linkage agents can communicate either poorly-conceived or well-conceived innovations equally well. Their ability to modify practice with either kind of innovation can also have profound consequences.

The differential consequences of linkage agents' actions eventually become apparent. For example, some one or some group was responsible for the widespread utilization of the lock-step graded elementary school concept, the rigid desks and chairs used in schools, the pointless equipment installed on many elementary-school playgrounds, and the many incoherent psychometric tests now in use. Conversely, some one or some group was responsible for the widespread utilization of individualized reading kits, "Sesame Street," facilities for "special needs" children and youth, and school-based driver education opportunities. Linkage agents apparently did not routinely take into account the quality or worth of the innovations they offered for adoption.

More is expected of linkage agents today. When people decide to change, they presume that the change will be in a positive direction. Linkage agents are often asked to provide the specific kinds of advice and guidance which are necessary to insure success. Hence, linkage agents assume

much more responsibility for **successfully** modifying practice in today's world than they did in the past.

It is the purpose of this chapter: to provide a perspective on knowledge diffusion/utilization theory; to describe patterns of knowledge diffusion/utilization research; and to present selected practical applications of knowledge diffusion/utilization know-how which are apt to have an impact upon the behavior of persons responsible for linking knowledge-production to the needs of knowledge users.

A PERSPECTIVE ON KNOWLEDGE DIFFUSION/UTILIZATION THEORY

James B. Conant noted in an address before the Sixteenth Annual Association for Supervision and Curriculum Development Conference that the trial-and-error method of advancing practical knowledge is successful only to the degree that the experimenter can make a valid judgment as to the outcome of the experiment. He must be in a position to decide whether the outcome of the experiment improves conventional practice in some manner. Accumulated experience and skill developed through long practice are essential in making such judgments in fields where the theoretical component is still small.

In the Middle Ages, Conant observed, it was the skill and experience of the metal-making artisan alone which supplied the basis for a decision. Some cities became famous for the quality of their products during this period; their fame was an outcome of the successful crude evaluations of experienced artisans. Today, chemistry and physics supply concepts and techniques which enable a metal maker to speak with precision about better and worse procedures for making better or worse metallic products. The introduction of a theoretical component into these fields has resulted in a substantial improvement in the criteria used for passing judgment on the outcome of an experiment.

The history of medicine in this century provides another excellent example of the use of fruitful trial-and-error experimentation. Tests of specific hypotheses in the context of extensive practical know-how contributed widely-held theory. The relation of bacteria and viruses to disease is an obvious example.

Advances in practical knowledge are just as cumbersome for many of today's social scientists as they were for the metal-making artisans of the middle ages. Standard operating procedures, which are rooted in accumulated experience and skills, tend to be too personalized to contribute significantly to the evolution of viable theory. Social-change theory, as an example, is a melange of intuition, contention, and evidence.

Social-change theory is more hope than substance. Even though scholars have saturated social-science archives with change theories, models, and configurations, all of which are supposed to have some predictive utility, none survive practical applications. Neither the speculative and amorphous grand theories of social change nor the quasi-experimental contemporary theories of social change provide the kinds of blueprints needed by persons who are involved with the change enterprise.

Knowledge diffusion/utilization theory, a sub-set of social-change theory, accurately mirrors perturbations of the mother theory. Several different conceptual systems which address pertinent facts of diffusion/utilization are recognized; however, each more accurately represents a point of view than a theoretical model. Since persons who write about these systems usually identify them as "models," the word model is used here as well.

Model A.	The Problem-Solver Model
Model B.	The Research Development-and-Diffusion Model
Model C.	The Social-Interaction Model
Model D.	The Linkage Model

Havelock used the word "model" most cautiously as he elaborated upon each.

Model A. Knowledge users' needs are diagnosed, translated into problem statements, and resolved collaboratively. Outside change agents, if utilized, serve in non-directive ways. The model presumes that self-initiated activities are most likely to be implemented and sustained. Model A is a residual of group problem-solving and is identified with the human-relations movement.

Model B. Rational planning from invention to utilization, systematic evaluation, division of labor, and separation of functions and roles typify Model B. Knowledge production is routinely offered to passive, targeted audiences. An important assumption of Model B is that users will accept knowledge if it is offered through an appropriate vehicle, in an appropriate manner, at an appropriate time. The corporate research tradition best illustrates Model B.

Model C. The movement of messages across people and across systems is highlighted. How an innovation is introduced to target audiences and how an innovation spreads within a social system are salient concerns. A belief that people tend to adopt and maintain messages which are perceived as normative for their psychological reference-group is implied. Rural and medical sociologists have developed an extensive body of empirical data within this conceptual system.

Model D. The conceptual system for this model involves a knowledge-user as a problem-solver, a problem-solving **modus operandi** which links the user with a resource system, the generation of solutions which meet the needs of the user, and the application of viable solutions. Knowledge flows back and forth within a complex network of roles and relationships. The federally-initiated National Diffusion Network illustrates a current application of Model D.

Others have offered accounts of diffusion/utilization models which differ somewhat from Havelock's. For example, Sashkin, et al., (1973) described a Planned Change Model and an Action Research Model in the Psychological Review. While they sound unique, neither of the models departs dramatically from the models already described. What Havelock has offered seems to summarize the state-of-the-art of knowledge diffusion/utilization model-building.

None of these "models" seems to be meaningfully related to advances which are taking place in knowledge diffusion/utilization practice, unfortunately. A rather powerful diffusion/utilization research tradition is blossoming within more than half-a-dozen social-science disciplines, which is not associated with any of the conceptual systems mentioned above. Specific research does relate to specific models, of course. However, the tradition seems rooted in the acquisition of experimental evidence and tied to the independent replication of reported research. Numerous advances in practical knowledge seem to be a residual of this process.

Among advances in practical knowledge attributed to the diffusion/utilization research tradition are the following:

1. The development and implementation of many aspects of the U.S. Department of Agriculture's Cooperative Extension Service.
2. The development and implementation of a most effective field-agent role within the pharmaceutical industry.
3. The development and implementation of a national diffusion network to serve professional educators.

The first advance evolved over more than half a century, the second over more than a quarter of a century, and the third over nearly a decade. How one might relate one or more of the previously mentioned diffusion/utilization models to these advances isn't clear.

BUILDING VIABLE KNOWLEDGE DIFFUSION/UTILIZATION KNOW-HOW

Literature scans, covering the period between 1946 and the present, reveal that hard work and creative ingenuity aimed at building viable knowledge diffusion/utilization know-how is being expended. Persons responsible for such inquiry offer varied sets of variables for contemplation as potential determinants of change; they suggest varied ways in which identified variables follow a sequence leading to change; they speculate upon varied ways in which identified variables follow a sequence leading to change; they speculate upon varied ways in which interactions of identified variables bring about change; and they speculate upon ways to proportionally weigh identified variables in relation to each variable's potential impact upon change. Examples of such inquiry are offered in the following paragraphs.

Identifying Variables. Different individuals have offered sets of variables for a number of reasons. Typically, these sets are used to plan diffusion/utilization work, to predict diffusion/utilization outcomes, and/or to diagnose problems within diffusion/utilization endeavors. Examples are offered to clarify each application.

Persons at the Battelle Memorial Institute in Columbus, Ohio, identified twenty-one factors which impacted upon the diffusion of ten outstanding scientific innovations (Globe, 1973). These factors are listed in the order of their significance, which was determined by measuring the frequency of occurrence of each factor during critical incidents in the diffusion of the innovations:

1. Recognition of technical opportunity.
2. Recognition of the need.
3. Internal R & D management.
4. Management venture decision.
5. Availability of funding.
6. Technical entrepreneur.
7. In-house colleagues.
8. Prior demonstration of feasibility.
9. Patent/license considerations.
10. Recognition of scientific opportunity.
11. Technology confluence.
12. Technological gatekeeper.
13. Technology interest group.
14. Competitive pressures.
15. External direction to R & D personnel.
16. General economic factors.
17. Health and environmental factors.
18. Serendipity.
19. Formal market analysis.
20. Political factors.
21. Social factors.

Battelle officials believe that these factors are of probable importance in determining the direction and rate of the innovative process. Hence, awareness of the twenty-one factors may improve the diffusion/utilization planning process.

Zaltman, et al. (1973) studied an array of attributes which semed relevant to describing, explaining, and predicting responses to innovations. Nineteen attributes were identified by them:

1. **Cost**--financial and social, initial and continuing.
2. **Returns to Investment**--tangible and intangible.
3. **Efficiency**--overall timesaving and avoidance of bottlenecks.
4. **Risk and Uncertainty**--on the part of early adopters; lessened for later adopters.
5. **Communicability**--ease of dissemination and clarity of results.
6. **Compatibility**--consistency with "existing values, past experiences, and needs of receivers."
7. **Complexity**--of ideas and in actual implementation.
8. **Scientific Status**--reliability, validity, generality, etc.
9. **Perceived Relative Advantage**--its

visibility and demonstrability.

10. **Point of Origin**--whether from within or from without the organization.
11. **Terminality**--point beyond which adoption becomes less rewarding, useless, or even impossible.
12. **Status Quo Ante**--reversibility and divisibility.
13. **Commitment**--prior attitudinal or behavioral acceptance.
14. **Interpersonal Relationships**--impact on a disruptive integrative continuum.
15. **Publicness versus Privateness**--availability to all members of the social system.
16. **Gatekeepers**--number of approval channels.
17. **Susceptibility to Successive Modification**--ability to refine or modify innovation.
18. **Gateway Capacity**--opening of avenues to other innovations.
19. **Gateway Innovations**--instrumental setting of stage for large-scale innovations.

These attributes are not listed in their order of importance, as was the case of the Battelle example. Rather, each attribute is apt to have a differential effect within a given targeted setting. These effects seem to be related to unique aspects of a targeted setting and to the different stages in the diffusion/utilization process.

Finally, Havelock and Lingwood (1973) offered a set of variables for diagnosing communication problems which occur between senders and receivers. Their set forms the acronym HELP SCORES:

1. **Homophily:** Similarity of characteristics of sender and receiver.
2. **Empathy:** Understanding and feeling for the other and the other's situation.
3. **Linkage:** Contact or relationship between persons or groups.
4. **Proximity:** Placement of persons or groups near each other.
5. **Structuring:** Evidence of planning, ordering, systematic arrangement.
6. **Capacity:** Sign of affluence, talent, experience, wisdom, etc.
7. **Openness:** Sign of willingness to listen, receive, give, tell, etc.
8. **Reward:** Provision of financial support, security, esteem, status, etc.
9. **Energy:** Investment of time and effort, persistence, aggressiveness.
10. **Synergy:** coming together of forces, orchestration, synchronization, etc.

Since each factor can be scaled and then rated, the authors have been able to use HELP SCORES to identify problem-aspects of diffusion/utilization work.

Other sets of variables, which are potential determinants of diffusion/utilization outcomes, are easily uncovered in the literature and can be used to illustrate each of the above-mentioned points. For instance, Davis (1971) offers A VICTORY, an acronym that encompasses eight factors of importance to the diffusion and utilization of new knowledge. And Glaser (1973) conceived CORRECT, an acronym that highlights seven characteristics of new knowledge which seemed to be related to diffusion/utilization consequences.

Perhaps the most promising aspect of these sets is their similarity. Even though the five sets cited above were conceived independently within diverse academic disciplines, all share common variables and common concerns. Some day such similarities may be interwoven by ingenious individuals into a "master" set and then successfully field tested within a variety of academic traditions.

Sequencing Variables. The North Central Rule Sociology Subcommittee for the Study of Diffusion of Farm Practices postulated a five-stage "adoption process" model to account for the process of diffusion/utilization that occurs over time. Their model, offered in 1955, attempted to standardize the so-called adoption process. The five stages were:

1. Awareness
2. Interest
3. Evaluation
4. Trial
5. Adoption

No model has recieved more attention in the literature, which is a tribute to the Committee's industry.

There have been numerous attempts since 1955 to refine the adoption process model to make it more functional. Many of these subsequent efforts attempted to relate research being done on relevant variables to stages in the adoption process. Rogers and Shoemaker (1971) describe such a four stage "innovation-decision process." These stages are as follows:

1. Knowledge
2. Persuasion
3. Decision
4. Confirmation

Their model was designed to overcome various criticism of the 1955 adoption process and also to reflect relevent research which had been conducted on the process.

A somewhat different tack was pursued by Hovland (1954), Smith (1946), and Havelock (1969). Havelock, to illustrate this alternative, believed that the process involved an interaction between a user and a resource. He set forth a six-stage formula for analytic purposes. His formula involved:

Who says **what** to **whom** and **what channel** to **what effect** for **what purpose**? Relevant research is easily related to each of the six stages.

More recently, Berman, et al. (1975); affiliated with the Rand Corporation, suggested three stages in the diffusion/utilization process:

1. Initiation
2. Implementation

3. Incorporation

Their conclusion was derived from a study of federal programs supporting educational change.

The trend toward relating research pertaining to salient variables to the process of diffusion/utilization is encouraging, because it gives order to what is known about the variables. If subsequent research reveals that systematic patterns of adoption exist, the revelation will culminate the process begun by the North Central Rural Sociology Subcommittee in 1955.

Variables Interaction and Variable Weighting. Not much is known about either of these matters yet, because both thwart systematic study. Personal variables, organizational variables, and communication variables need to be addressed within specific contexts in order to ascertain interaction effects. Then, interaction effects across contexts need to be addressed in order to prioritize the variables. While some researchers have attempted to address specific aspects of these problems, neither variable interaction nor variable weighting have been studied systematically to date.

Bhola (1965) set forth a configurational theory of the diffusion of innovations which addressed the interaction of variables. He has continued to refine the theory over the years and in 1977 offered a comprehensive publication which summarizes progress being made. Bhola believed optimum diffusion to be a function of four variables (configurations, linkages, environments, and resources) which could be expressed as:

$$D(opt.) = f\ (C, L, E, R)$$

He believed that the four variables C, L, E, and R must be synergetically optimized to increase the possibility of a change-event occurring. Clark and Guba (1974) have also studied the problem of variable interaction. Their views were put on the record at the annual meeting of the Council for Educational Development and Research, Inc., in 1974. Both Bhola's theory and Clark and Guba's configurational perspective have provided much discussion, but little field application has occurred thus far.

The Battelle researchers, mentioned earlier, prioritized the twenty-one diffusion/utilization factors which were identified, and they also interrelated the factors within six broader themes. Their work serves as a road map for researchers who aspire to study either variable interaction or variable weighting.

Continuing empirical refinement of the work described above is obviously necessary. How to accomplish these refinements so that research outcomes ultimately relate the practice of knowledge diffusion/utilization is not clear.

Unfortunately, persons responsible for linking knowledge production with the needs of knowledge users routinely fail to capitalize upon accomplishments such as those described above. Progress is impeded because what has been learned isn't made available in forms apt to be used by them. And within many disciplines it is not reasonable to believe that linkers are capable of using what has been learned **to engineer** diffusion/utilization **modus operandi** which will bridge the theory-practice gap. The slow pace of meaningful change within disciplines such as education represents mute testament to the expanse between theory and practice.

Researchers need to translate what is known about linking knowledge production with the needs of knowledge users into forms which can be understood by persons responsible for the linkage enterprise. Approaches used to train county extension agents and radar repair persons, for example, provide clues for identifying the steps needed next.

TRANSLATING LINKAGE KNOW-HOW INTO A FORM APT TO MEET NEEDS OF LINKERS

The author, since 1963, has aspired to conceptualize a theoretical diffusion/utilization "configuration" which meaningfully represents the accumulating empirical research on the topic. Every attempt to do so was subjected to intense critical review, then revised as needed or discarded when necessary. Many attempts were required before a configuration was generated which withstood the critical review.

The resulting configuration takes into account variables and processes of importance to knowledge diffusion/utilization. The variables amount to important ingredients needed to successfully expedite diffusion/utilization tasks. The processes amount to directions for combining the ingredients and doing something with them over time.

Think of baking a cake as an appropriate analogy. Certain ingredients (variables) and certain directions (processes) are specified in a recipe for preparing angel food cake. Once the recipe has been proven effective (that is, delicious angel food cakes are produced), the recipe can be used by many people with reasonable success. Someone had to specify the ingredients (variables) and directions (processes) needed to produce an angel food cake. Someone must follow this same procedure--that is, select appropriate variables and processes--to resolve diffusion/utilization problems.

The configuration consists of four classes of variables (conditions for change, characteristics of the innovator, characteristics of the innovation, and characteristics of the target audience) and one class of processes (systems of linkage). Figure 29-1 provides an overview of these variables and processes in relation to outcomes which are conceivable. Researchers typically treat the **classes of variables** as independent variables; the **classes or processes** are treated both as independent and dependent variables; whereas **outcomes** are typically treated as dependent variables.

The configuration described above served as a point of departure for a series of

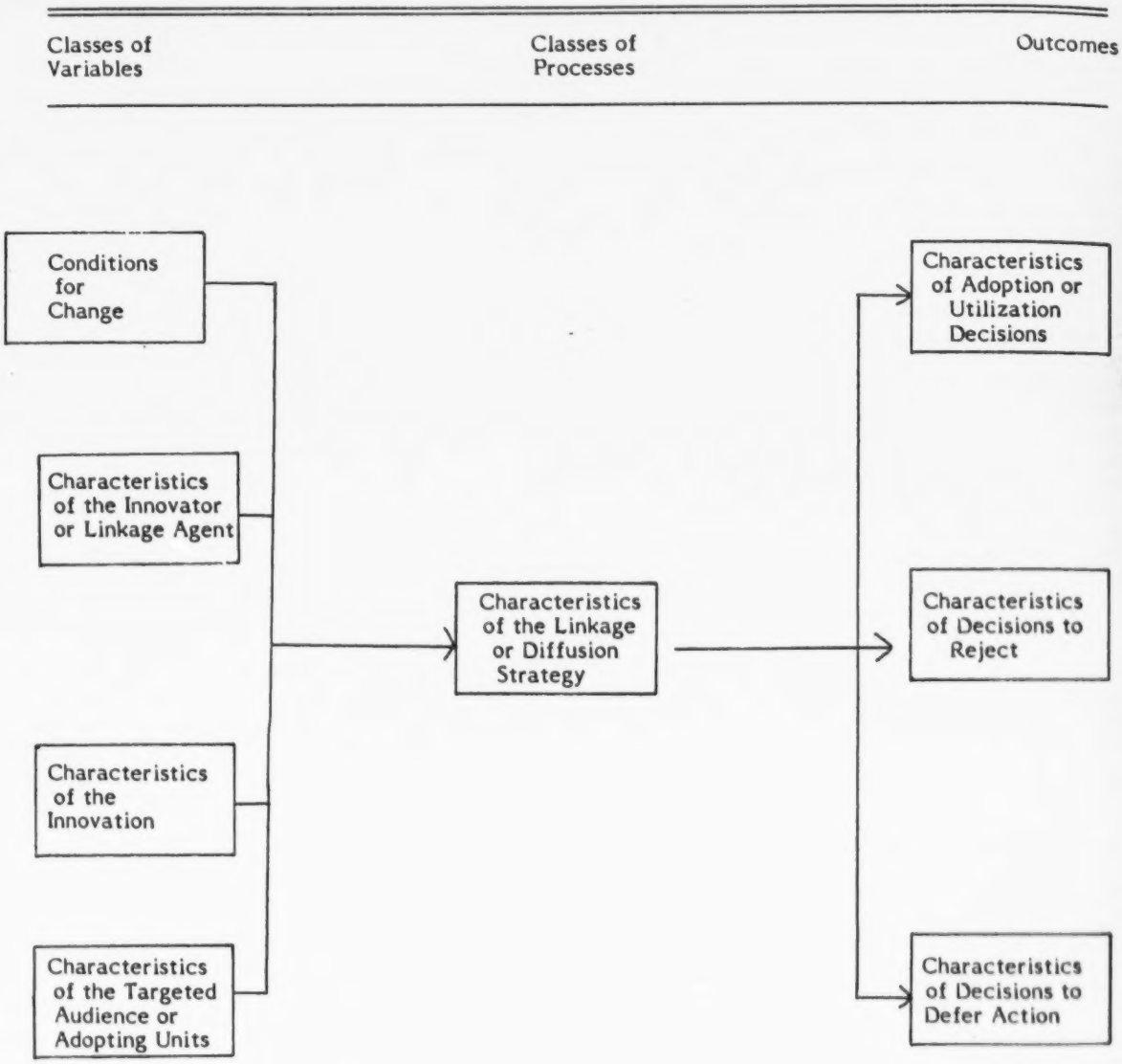
Classes of Variables
Classes of Processes
Outcomes
Conditions for Change
Characteristics of the Innovator or Linkage Agent
Characteristics of the Innovation
Characteristics of the Targeted Audience or Adopting Units
Characteristics of the Linkage or Diffusion Strategy
Characteristics of Adoption or Utilization Decisions
Characteristics of Decisions to Reject
Characteristics of Decisions to Defer Action

Figure 29-1. Classes of variables and processes related to knowledge diffusion/utilization phenomena.

diffusion/utilization studies by the author and his associates. These studies were focussed upon how to link the world of knowledge production with the needs of knowledge users. Work completed by Wolf, Fiorino, Hutchinson, Welsh, Allan, Goodman, and Thayer between 1973 and 1980 made clear: (a) specific variables and processes to be addressed; (b) a **modus operandi,** called metamethodology (See Metamethodology chapter this work), for addressing the variables and processes; and (c) how to apply outcomes of the enterprise. The remainder of this chapter addresses the third point; that is, how to apply outcomes of the enterprise.

PRACTICAL APPLICATIONS OF KNOWLEDGE DIFFUSION/UTILIZATION KNOW-HOW

Two instruments have been prepared for use by persons who assume responsibility for linking the world of knowledge production with the needs of knowledge users. The first instrument is called the Wolf-Welsh Linkage Methodology (WWLM), and the second is called the Wolf Knowledge Diffusion/Utilization Inventory (WKD/UI). Both were designed to meet the needs of persons responsible for linkage work.

WWLM. Preliminary work on the first tool was undertaken by William A. Welsh and the author about seven years ago. Welsh aspired to develop a "dissemination methodology" which would meet needs through the dissemination of products. He based his work upon the theoretical contributions of Thomas E. Hutchinson and W. C. Wolf, Jr., both of the University of Massachusetts at Amherst. Hutchinson designed a tool, called metamethodology, to build specific methodologies. Wolf set forth a conceptual framework for tackling practical problems of communication (See Figure 29-1).

Welsh's dissemination methodology was designed to be systematized, standardized, and operationalized. The term **"systematized"** indicates that there is a logical reason for the inclusion of each step in the methodology. The term **"standardized"** means that different persons using the methodology can apply the same set of rules and procedures. And the term **"operationalized"** means that the rules and procedures are stated with sufficient specificity to facilitate uniform comprehension.

The methodology consisted of ten primary steps and numerous sub-steps. Only a partial field test of the instrument was carried out, because funds earmarked for the work were cut back. Nevertheless, Welsh documented that the instrument: (a) anticipated and isolated potential linkage problems which he could address expeditiously; (b) was easy to utilize; (c) facilitated systematic evaluation work; and (d) facilitated replication, as each application of the instrument constituted a field test of it.

Subsequently, Allan (1977) and Goodman (1976) completed projects intended to expand and update the conceptual base of the methodology. Informal field tests of the tool were also completed by three doctoral students. These data identified a need to revise the instrument substantially. The author initiated the revision in 1978 and completed the work sixteen months later.

The revision was retitled the Wolf-Welsh Linkage Methodology. It consists of nine primary steps and numerous sub-steps. The primary steps (and the number of sub-steps) are:

I. Attributes of Persons Apt to Use the Linkage Methodology Effectively (six steps).
II. Identification of a Targeted Audience's Need to Modify some Aspect or Aspects of Professional Practice (five steps).
III. Identification of Practices and/or Products Apt to Meet Identified Target Audience's Needs (two steps).
IV. Selection of Practices and/or Products Apt to Meet Identified Target Audience's Needs (four steps).
V. Modification of Practices and/or Products Selected to Meet Identified Needs of Targeted Audience (three steps).
VI. Determination of Demographic Characteristics and Certain Attitudes (Toward the Plan to Modify Some Aspect or Aspects of Professional Practice) of the Targeted Audience (four steps).
VII. Conceptualization and Implementation of Strategies and Tactics Intended to Incorporate Designated Practices and/or Products Within the Professional Practice of the Targeted Audience (three steps).
VIII. Part One. Evaluation of the Modification in Practice (three steps).
Part Two. Evaluation of the Methodology (one step).
IX. Recommendations for Improving Upon Linkage Methodology (Steps I through VIII) on the Basis of Evaluation Results (Offered by Persons who Used the Methodology) (four steps).

Steps II, IV, and V pertain to **Conditions for Change**; Step I to **Characteristics of the Innovator or Linkage Agent**; Steps III, IV, and V to **Characteristics of the Innovation**; Steps II and VI to **Characteristics of the Targeted Audience or Adopting Unit**; Step VII to **Characteristics of the Linkage or Diffusion Strategy**; and Steps VIII and IX to the three outcomes mentioned.

This revision makes the nine steps more compatible with the theoretical framework upon which they rest; it incorporates a variable class (characteristics of the innovator) not addressed by Welsh initially; and it is a less prolix tool (even though the overall length of the tool has been reduced, the number of specific directions and examples have been increased).

Recently-completed informal field tests of the revised methodology conducted by three doctoral students revealed that the methodology: (a) met the needs of a director of a federally-supported project serving a local education agency; (b) met the needs of a person leading a municipal rezoning effort; and (c) met the needs of a state education agency official who employed the tool as part of an ex post facto study of proposals processed through his agency requesting federal research funds. A more formal field test of the instrument is currently under way in North Carolina in conjunction with a regional curriculum resource dissemination center of the Women's Educational Equity Act program.

Most recently, Thayer (1981) completed a comprehensive study of the WWLM, in which he surveyed, updated, and analyzed just the educa-

tional portion of the research-and-development work upon which the WWLM is based. He organized relevant studies identified under twenty-six generalizations which form the nucleus of the revised WWLM (three of these generalizations relate to conditions for change; five to the linkage agent; seven to the innovation; five to the targeted audience; four to the linkage modus operandi; and two to outcomes.) Thayer reported that the bulk of what exists within the educational archives isn't empirical in nature and doesn't effectively address many of the generalizations. He concluded that educational researchers' contributions to the twenty-six generalizations that support the WWLM have been mostly inconsequential. His work also raised questions about the applicability of the WWLM within educational contexts, given the modicum of viable educational research in existence to support or to challenge its utilization.

Further field tests of the WWLM are needed to establish its credibility. Steps are currently being taken by the author to obtain these data.

WKD/UI. Analysis of data, provided by persons who had made use of some or most of the steps of both versions of the linkage methodology, revealed a need for more systematic data acquisition. These persons described the kinds of data which were needed and indicated points in the sequence of steps at which these data would be useful. What the users sought was a more systematic approach to the acquisition of data (a) which was related to specific steps of the linkage methodology, and (b) which was related to decisions that linkers needed to make. Feedback provided by these persons was responsible for the evolution of a second instrument, called the Wolf Knowledge Diffusion/Utilization Inventory.

The theoretical configuration previously discussed (see Figure 29-1) provided a frame of reference for conceptualizing categories and items to be included within an inventory which would meet needs of linkage agents. Focal points of departure for conceptualizing items within this framework were (a) needs for data indicated in specific steps of the linkage methodology and (b) decisions that linkers needed to make during the communication process. Items were conceived, critiqued, field tested and revised five times until an inventory--consisting of five separate sections--emerged which seemed to fulfill the expectations held for it.

Part One of the WDK/UI focuses upon four "conditions" for change within targeted environments. **Part Two** highlights characteristics and commitments of the person(s) responsible for the linkage. **Part Three** emphasizes characteristics of the innovations(s) to be institutionalized. **Part Four** places emphasis upon characteristics of environments targeted for change. And **Part Five** focuses upon characteristics of selected communication strategies and tactics.

Each part of the instrument consists of four items. Up to four points can be earned for each item; hence, the range of scores possible is zero to eighty. Scores obtained can be related to four different aspirations set forth for the change enterprise. Average scores that are equal to or exceed the minimal average scores needed to fulfill the change aspirations suggest that the linkage plans are on target. Average scores that fall below the minimal average scores needed to fulfill the change aspirations suggest that the aspirations may not be realized. Below-average scores should alert the linkage personnel to re-examine the linkage plans they have made.

The WKD/UI has been designed to accompany the WWLM. The Inventory aspires to provide persons making use of the WWLM with decision-oriented data of importance to the linkage enterprise. These data can be used to reduce the guesswork associated with the linkage enterprise, they can be used to address whatever problems might arise, and they can be used to alter linkage plans **prior** to commitment of extensive resources. Persons using the Inventory have the added advantage of objective documentation to support some or many of their linkage decisions.

Further field tests of the WKD/UI are also needed in order to establish its credibility. Steps are currently being taken by the author to obtain these data.

IMPLICATIONS

The American Telephone and Telegraph Corporation has evolved a linear knowledge production-and-utilization system which effectively meets the needs of many people. The system includes: Bell Telephone Laboratories, a unit dedicated to invention and innovation; Western Electric, a unit responsible for the translation of new practices, products and ideas into forms that can be utilized within the AT&T system; and numerous regional telephone subsidiaries, units responsible for the delivery of varied communication services designed to meet needs of clients. AT&T's system is an example of the Research, Development and Diffusion model Havelock described earlier. The system not only works, but it works extremely well.

What works for "Ma Bell" may or may not meet the needs of a diverse social-science clientele. Definitive information on how best to meet the needs of these individuals certainly does not exist. Implications can be drawn from the previous pages to infer: that a linear model may be too restrictive for social-science researchers and practitioners; that the practitioners' need for knowledge varies too substantially to be met by any one particular approach; that knowledge production in the social sciences usually emerges as "ordinary knowledge," a form not apt to lead to clear-cut gains in practice; and that knowledge is a most erratic phenomenon.

Whereas the AT&T system's linear model is probably too prescriptive to accommodate these four inferences, the AT&T approach--rooted in a tradition of disciplined inquiry--ought not be

ignored by researchers interested in bridging the knowledge production/knowledge utilization gap. Much relevant information already generated within rural and medical sociology illustrates what is possible in the social sciences through the disciplined use of inquiry methodologies. More of the same is needed.

This author offers linkage agents a frame of reference and two tools which facilitate disciplined inquiry. His "theoretical configuration" identifies salient classes of variables and processes of importance to the diffusion and utilization of knowledge. The configuration itself establishes a frame of reference for the disciplined inquiry.

The Wolf-Welsh Linkage Methodology translates the theoretical configuration into nine action-steps. The methodology is akin to a road map which specifies a starting point, alternate routes, and a destination. Persons who rely upon methodology aren't apt to lose sight of their aspirations or to make foolish decisions. Nor are they likely to fail, because the methodology is designed to ward off failure.

The Knowledge Diffusion/Utilization Inventory arms linkage agents with the kinds of data upon which rational decisions are made. Rational decision-making is the keystone of disciplined inquiry. The extra effort required to apply the Inventory is more than justified by the benefits accrued.

Linkage agents who use the configuration and the two tools are able to critically review their actions, make changes in their behavior as needed, and probably improve their effectiveness over time. Furthermore, the **modus operandi** of these linkage agents can be independently replicated without too much loss in precision. These are the elements of disciplined inquiry!

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APPENDIX I:
WOLF-WELSH LINKAGE METHODOLOGY

I. **ATTRIBUTES OF PERSON APT TO USE THE LINKAGE METHODOLOGY EFFECTIVELY**
   - A. Prior experience of person.
     1. Person has successfully linked some aspect of knowledge production with some aspect of knowledge utilization within an institutional setting at least once, preferably twice.
     2. Person's professional background and demographic characteristics and the professional background and demographic characteristics of the typical member of a targeted audience are reasonably compatible.
   - B. Person is able to devote considerable time (hopefully, at least one day per week) to the linkage task.
   - C. Person can be counted upon to deliver promised services on time.
   - D. Person either has been trained to do some aspects of the following work or is accustomed to contracting with specialists for work desired:
     1. Assess needs of targeted audiences.
     2. Survey literature for various reasons, be able to retrieve pertinent material, and be able to meaningfully summarize results.
     3. Ascertain demographic characteristics and attitudes of targeted audiences.
     4. Conceptualize and then expedite diffusion/utilization strategies and tactics.
     5. Conceptualize and then expedite evaluation strategies and tactics.
     6. Prepare coherent project reports.
   - E. Person understands basic elements of individual and group motivation and is able to apply such know-how routinely.
   - F. Person listens well and communicates effectively.

II. **IDENTIFICATION OF A TARGETED AUDIENCE'S NEED TO MODIFY SOME ASPECT OR ASPECTS OF PROFESSIONAL PRACTICE**
   - A. Define parameters of a targeted audience.
     1. Specify members of a targeted audience (i.e., all persons in two elementary schools, or special education personnel in a large city).
     2. Clarify roles of persons within the targeted audience (i.e., students, teachers, supervisors, administrators, etc.)
   - B. Ascertain needs of the targeted audience to modify practice, using modus operandi such as the following:
     1. Examine relevant materials (for example, local, state, and federal education-agency documents) for agency policy-shifts, expansion, or contraction.
     2. Conduct surveys of various members of the targeted audience (use a packaged needs-analysis methodology if applicable and if time permits).
     3. Compare practices of targeted audience with practices of other, similar groups.
     4. Examine available test results.
     5. Examine available demographic data (i.e., population trends) which pertain to the targeted audience.
   - C. List and prioritize needs of targeted audience.
     1. Prepare a list of the identified needs.
     2. Distribute the list to various members of the targeted audience for the purpose of determining their priorities (repeat as necessary until a clear picture of priorities unfolds).
     3. Use members' responses as a point of departure for establishing a prioritized list of needs.
   - D. Clarify who will participate in the final selection of the specific need or needs to be addressed (i.e., a committee, all involved persons, etc.)
   - E. Use the following criteria to facilitate selection of the specific need or needs to be addressed.
     1. Resources required to meet the need or needs.
     2. Time required to meet the need or needs.
     3. Positive and negative consequences of meeting the need or needs

4. Extent of target audience support/agreement.

NOTE: If the needs of a well-defined targeted audience have been ascertained, simply review what has been accomplished in light of the elements of Step II. Carry out only that work which has been overlooked or deleted from the initial effort.

III. IDENTIFICATION OF PRACTICES AND/OR PRODUCTS APT TO MEET IDENTIFIED TARGET AUDIENCE'S NEEDS

A. Determine existence of practices and/or products apt to meet need or needs.
   1. Search existing information repositories for desired know-how (i.e., ERIC, EPIE Institute, CEDaR Catalog, the PREP reports, etc.).
   2. Search catalogues of publishers and other vendors for desired know-how.
   3. Survey other groups which are like the targeted audience to find out what relevant practices and/or products are being used.
   4. Survey selected members of the targeted audience for desired know-how.
   5. Survey specialists for desired know-how.

B. Prepare a list of the available practices and/or products apt to meet the need or needs.

NOTE: If a specific practice and/or product is known which probably will meet the need or needs identified, and if further searching and surveying does not seem appropriate or necessary, work called for in Step III may be reduced or eliminated entirely.

IV. SELECTION OF PRACTICES AND/OR PRODUCTS APT TO MEET IDENTIFIED TARGET AUDIENCE'S NEEDS

A. Distribute the prepared list of practices and/or products to various members of the targeted audience for the purpose of determining their priorities (repeat as necessary until a clear picture of priorities unfolds).

B. Prioritize the list on the basis of responses received.

C. Clarify who will participate in the final selection of the practices and/or products.

D. Establish criteria such as the following, set forth conditions for acceptance/rejection, and then use the criteria to facilitate selection of the specific practices and/or products.
   1. Resources required to effectively utilize the practices and/or products.
   2. Time required to effectively implement the practices and/or products.
   3. Positive and negative consequences of implementing the practices and/or products.

NOTE: If a specific practice and/or product is known which probably will meet the need or needs identified, work called for in Step IV may be reduced or eliminated entirely.

V. MODIFICATION OF PRACTICES AND/OR PRODUCTS SELECTED TO MEET IDENTIFIED NEEDS OF TARGETED AUDIENCE

A. Ascertain (using some sort of survey procedure) the extent to which selected practices and/or products are compatible with generally-accepted professional practices of the target-audience members.
   1. Compatibility (i.e., updating science instructional-resources) is a positive indicator.
   2. Incompatibility (i.e., offering--for the first time--junior high school students an elective sex-education class) indicates further action must be contemplated.
      a. Review specifics of the selected practices and/or products for the purpose of isolating troublesome elements.
      b. Delete troublesome elements if possible.
      c. If troublesome elements cannot be deleted, reduce them to their least controversial form.
      d. Make plans to cope

with all aspects of adversity (related to the controversial elements) which can be anticipated.

B. Divide the selected practices and/or products into their most basic elements.
   1. Make plans to introduce the selections either piecemeal or in toto.
   2. Make plans to introduce the selections as a pilot undertaking or in toto.
   3. Prepare cost-estimates for implementing the various options suggested in Steps V.B.1. and V.B.2. above.

C. Expedite whatever additional adaptations of the selections that might seem appropriate for enhancing the probability of modifying the specified professional practices.

VI. DETERMINATION OF DEMOGRAPHIC CHARACTERISTICS AND CERTAIN ATTITUDES (TOWARD THE PLAN TO MODIFY SOME ASPECT OR ASPECTS OF PROFESSIONAL PRACTICE) OF THE TARGETED AUDIENCE

A. Survey members of the targeted audience to ascertain their prior history of professional self-renewal.
   1. Identify those persons (self-renewers) who routinely modify their professional practice.
   2. Identify those persons (entrenchers) who seldom modify their professional practice.

B. Use an uncomplicated sociometric survey technique (many options are available) to ascertain who are the "influentials" and who are the "isolates" within the targeted audience.
   1. Identify the influentials.
   2. Identify the isolates.

C. Interview a sample of the identified self-renewers and of the influentials to determine their respective attitudes toward the practice and/or products selected to meet specified needs of the targeted audience.
   1. Affirmation is a positive indicator.
   2. Either mixed reactions or opposition indicates further action must be contemplated.
      a. Review specifics of the interviews completed to isolate the sources of controversy.
      b. Eliminate controversial aspects of the implementation undertaking if possible.
      c. If controversial aspects cannot be eliminated, confront the sources of controversy and either overcome them or neutralize them.
      d. Discontinue the attempt to modify professional practice using the selected practices and/or products, if the controversy persists in force.
      e. If the problem continues to fester, go back to Step II and try again.

D. There is no need to invest either time or resources interacting with persons identified as entrenchers or isolates at this point in the implementation.

VII. CONCEPTUALIZATION AND IMPLEMENTATION OF STRATEGIES AND TACTICS INTENDED TO INCORPORATE DESIGNATED PRACTICES AND/OR PRODUCTS WITHIN THE PROFESSIONAL PRACTICE OF THE TARGETED AUDIENCE.

A. Conceptualize a strategy (with appropriate tactics) which meets five conditions:
   1. The strategy is geared primarily to the enterprise of persons identified as self-renewers and influentials, but it also involves all persons who will be influenced by modifications in practice.
   2. The strategy involves two steps: Step one focuses upon self-renewers and influentials; step two utilizes these persons to influence others to the targeted audience.
   3. The strategy makes maximum use of interpersonal (preferably face-to-face and two-way) channels of communication.
   4. The strategy is participative in that all persons who are to be affected by the modi-

fications in practice participate in making decisions about the undertaking.

5. The strategy incorporates a time-line which projects the realization of specified aspirations.

B. Offer the conceptualized strategy (with appropriate tactics) to selected persons identified as self-renewers and influentials for their critical review, and then modify it on the basis of feedback provided.

C. Implement the strategy (with appropriate tactics).

1. Expedite step one of the two-step plan.
   a. Utilize varied interpersonal channels of communication to introduce the selected practices and/or products to the previously identified self-renewers and influentials.
   b. Work closely with the self-renewers and influentials until a core of them have modified their professional practice as desired.
   c. Recruit from the core of successful persons a small number willing to become involved in generalizing the modifications in practice to other persons within the targeted audience.
2. Expedite step two of the two-step plan.
   a. Utilize varied interpersonal channels of communication to share desired modifications in the practice of the recruited self-renewers and influentials with other members of the targeted audience.
   b. Work closely with the recruited self-renewers and influentials during their attempts to convince selected peers to modify practice as desired.
   c. Continue the process of interaction until a substantial core of the targeted audience has modified professional practice as desired.

VIII. **PART ONE. EVALUATION OF THE IMPACT OF THE DESIGNATED PRACTICES AND/OR PRODUCTS UPON THE PROFESSIONAL PRACTICE OF THE TARGETED AUDIENCE (EVALUATION OF THE MODIFICATION IN PRACTICE)**

PART TWO. EVALUATION OF THE EFFICACY OF STEPS I THROUGH VII TO MEET NEEDS THROUGH THE MODIFICATION OF SOME ASPECTS OF THE PROFESSIONAL PRACTICE OF A TARGETED AUDIENCE (EVALUATION OF THE METHODOLOGY)

A. Conceptualize evaluation plans which meet six conditions.

1. The plans make provision for formative data acquisition at regular intervals throughout the implementation undertaking.
2. The plans make provision for summative data acquisition.
3. The plans can be expedited within the framework of available resources.
4. The plans make provision for the preparation of reports which can be understood by persons responsible for decision-making, and by persons being affected by the modification in practice.
5. The plans are set forth so clearly that a valid independent replication of them would be conceivable.
6. The plans take into account standard reliability and validity concerns associated with gathering, analyzing, and reporting consequences of data.

B. Offer the conceptualized evaluation plans to at least one evaluation specialist for her or his critical review, and then modify the plans on the basis of the feedback provided.

C. Highlight four consequences of the selected practices and/or products upon the professional practice of the targeted audience when expediting the revised plans:

1. The number of persons who could have and the number of persons who actually did modify their professional practice as desired.
   a. Characteristics of the set of persons who opted to modify their practice as desired.
   b. Characteristics of the set of persons who opted **not** to modify their practice.
   c. Similarities and differences between the two sets of persons.
2. Perspectives, derived from the "adopting" set of persons, pertaining to whether or not their needs were met.
3. Perspectives, derived from the "adopting" set of persons, pertaining to positive and negative effects of the implementations upon their professional practice.
4. Relationships between resource consumption and time allocation on the one hand and the utilization of desired practices and/or products on the other.

D. Highlight the extent to which Step I through VII of the linkage methodology met needs of a targeted audience when expediting the revised plans.
   1. Perspectives, derived from the person or persons who used the tool, pertaining to the viability of Steps I through VII.
      a. Additional steps or sub-steps needed.
      b. Steps or sub-steps not needed.
   2. Perspectives, derived from the person or persons who used the tool, pertaining to the precision of language contained in Steps I through VII.
   3. Perspectives, derived from the person or persons who used the tool, pertaining to the precision of suggested activities contained in Steps I through VII.

IX. RECOMMENDATIONS FOR IMPROVING UPON THE LINKAGE METHODOLOGY (STEPS I THROUGH VII) ON THE BASIS OF EVALUATION RESULTS (OFFERED BY PERSONS WHO HAVE USED THE METHODOLOGY)

A. Set forth recommendations for increasing the precision of the language contained in Step I through Step VIII of the tool.
B. Set forth recommendations for increasing the precision of suggested actions contained in Step I through Step VII of the tool.
C. Set forth recommendations for adding steps or sub-steps to fill gaps recognized between Step I and Step VII of the tool.
D. Set forth recommendations for deleting steps or sub-steps deemed unnecessary between Step I and Step VIII of the tool.

APPENDIX II:

THE WOLF KNOWLEDGE DIFFUSION/ UTILIZATION INVENTORY, FIFTH REVISION

ORIENTATION

The Wolf Knowledge Diffusion/Utilization Inventory (WKD/UI) has been designed to accompany the Wolf-Welsh Linkage Methodology (WWLM). The Inventory was designed to provide persons making use of the Methodology with decision-oriented data of importance to the linkage enterprise. These data can be used to reduce the guesswork associated with communication enterprises, they can be used to address problems which arise, and they can be used to alter communication plans **prior to** the commitment of extensive resources. Persons using the Inventory have the added advantage of having objective documentation to support some or many of their linkage decisions.

The Inventory consists of six separate sections, the first five of which consist of four items each. Up to four points can be earned for each item; hence, the range of scores possible is zero to 80. Scores obtained can be used to judge the viability of aspirations set forth for the change enterprise (see Part VI of the instrument).

Parts I through **V** are designed to be implemented sequentially. **Part I** and **Part II,** for example, are intended to be implemented first; **Part III** and **Part IV,** second; and **Part V,** last. Such a sequence can be varied by linkers to meet their

PART I. ASCERTAINING CONDITIONS FOR CHANGE WITHIN TARGETED ENVIRONMENTS.

Conditions for Change	Weight		Score
1. Number of new practices and products successfully adopted within or adapted to the targeted environment(s) over the past three years.	a. none	-0-	
	b. Two to four	-2-	
	c. More than four	-4-	_____
2. Extent of dissatisfaction with current practice earmarked for change.	a. Little (fewer than 10% of persons affected are dissatisfied)	-0-	
	b. A moderate amount (ten to thirty percent)	-2-	
	c. Extensive (more than thirty percent)	-4-	_____
3. Availability of current "needs" assessment information pertaining to change contemplated.	a. None available	-0-	
	b. Some available	-2-	
	c. Much available	-4-	_____
4. Resource potential (i.e., risk money, facilities, flexible staff, etc., apt to be available) of environment to be changed.	a. None or limited	-0-	
	b. Moderate	-2-	
	c. Extensive	-4-	_____
			_____
			Total Score
			_____

respective needs. Data accumulated in this manner can then be related to **Part VI** to ascertain the viability of the linkage-agent's aspirations.

Part I focuses upon four "conditions" for change within targeted environments. **Part II** highlights characteristics and commitments of the person(s) responsible for the linkage. **Part III** emphasizes characteristics of the innovation(s) to be institutionalized. **Part IV** places emphasis upon characteristics of the environment targeted for change. And **Part V** focuses upon characteristics of selected communication strategies and tactics.

The data sought are relatively straightforward and obvious, with one exception. The person or persons responsible for the linkage enterprise must pass judgment upon their own characteristics and commitments when attending to **Part II**. There is a probable loss of precision as a residual of this self-appraisal.

The Wolf Knowledge Diffusion/Utilization Inventory is offered for examination and utilization by persons who assume varied communication responsibilities. It is not unreasonable to believe that the Inventory will serve these persons by increasing their effectiveness.

PART II. ASCERTAINING CHARACTERISTICS AND COMMITMENTS OF THE PERSON(S) RESPONSIBLE FOR LINKAGE.

Characteristics and Commitments of Persons		Weight		Score
1.	Prior history of successfully linking some aspects of knowledge production with some aspects of knowledge utilization in an institutional setting.	a. None b. Once or twice c. More than twice	-0- -2- -4-	_____
2.	Compatibility between characteristics and background of the linker(s) (i.e., training, experience, demographic characteristics, etc.) and the characteristics and background of a targeted audience.	a. Little or no compatibility b. Some compatibility c. Much compatibility	-0- -2- -4-	_____
3.	Amount of time committed by linker(s) to expedite the change undertaking.	a. Little (less than ten days total commitment) b. Moderate (more than ten days but less than one day per week throughout change undertaking) c. Extensive (at least one day per week throughout change undertaking)	-0- -2- -4-	_____
4.	Extent to which linker is capable of providing expertise (for example, needs assessment, evaluation, and diffusion know-how) likely to be needed throughout the change undertaking.	a. Not capable b. Some capabilities c. Most capable	-0- -2- -4-	_____
			Total Score	_____

PART III. ASCERTAINING CHARACTERISTICS OF INNOVATION(S) TO BE INSTITUTIONALIZED.

Characteristics of Innovation(s)		Weight		Score
1.	Extent to which information which establishes the worth of the proposed innovation(s) has been assembled.	a. None assembled b. Some assembled c. Much assembled	-0- -2- -4-	_____
2.	Problems apt to be associated with institutionalization of the proposed innovation.	a. Many b. Some c. None anticipated	-0- -2- -4-	_____
3.	Compatibility of the proposed innovation with existing practice.	a. Marked departure b. Somewhat compatible c. Most compatible	-0- -2- -4-	_____
4.	Extent to which the proposed innovation can be observed being utilized.	a. Not visible b. Occasionally visible c. Routinely visible	-0- -2- -4-	_____

_____

Total Score

_____

PART IV. ASCERTAINING CHARACTERISTICS OF ENVIRONMENTS TARGETED FOR CHANGE.

Environmental Considerations	Weight		Score
1. Number of persons in targeted environment to be affected by change.	a. Many (more than 200)	-0-	
	b. A moderate number (50 to 199)	-2-	
	c. Few (less than 50)	-4-	_____
2. Number of opinion leaders and other influentials identified within targeted environment likely to support the proposed innovation.	a. Few	-0-	
	b. About half to two thirds	-2-	
	c. Nearly all	-4-	_____
3. Number of decision-making levels (i.e., a school committee) in targeted environment.	a. Many (more than four)	-0-	
	b. A moderate number (three to four)	-2-	
	c. Few (one or two)	-4-	_____
4. Number of administrative units (i.e., academic departments) to affected by change.	a. Many (more than five)	-0-	
	b. A moderate number (three to five)	-2-	
	c. Few (one or two)	-4-	_____
			_____
			Total Score
			_____

PART V. ASCERTAINING CHARACTERISTICS OF SELECTED COMMUNICATION STRATEGIES AND TACTICS.

Characteristics of Communication Plans		Weight		Score
1.	Number of persons significantly assigned to make and carry out communication plans.	a. None b. One c. Two or more	-0- -2- -4-	_____
2.	Complexity (in terms of "outside" money required, resources needed, consultants needed, etc.) of communication strategies and tactics planned.	a. Most complex b. Somewhat complex c. Not complex	-0- -2- -4-	_____
3.	Percentage of targeted audience likely to be reached as a direct outcome of the communication effort.	a. Low (less than 15%) b. Moderate (16% to 50%) c. High (51% or more)	-0- -2- -4-	_____
4.	Extent to which settled communication plans are likely to facilitate interpersonal communication among linker(s), opinion leaders, and other members of targeted audiences.	a. Not likely b. Somewhat likely c. Most likely	-0- -2- -4-	_____
			Total Score	_____

PART VI. ASCERTAINING RELATIONSHIPS BETWEEN COMMUNICATION INTENTIONS AND COMPLEXITY OF TASK.

Add up scores recorded within each of the five parts of this instrument; pool the scores for all five parts; divide the resulting sum by five; then, compare the average score obtained with minimum scores needed (see page _) to fulfill each change aspiration.

COMPILATION OF RESULTS

Section	Score
Part I	_____
Part II	_____
Part III	_____
Part IV	_____
Part V	_____
Total Score	_____
Total Score ÷ 5	_____
Minimum Score Needed	_____
Difference	_____

Average scores that are equal to or exceed the minimal average scores needed to fulfill the change aspirations suggest that plans are on target. Average scores that fall below the minimal average scores needed to fulfill the change aspirations suggest that the aspirations may not be realized. Below-average scores should alert linkage personnel to re-examine their plans.

Figure 29-A.1. Minimum average scores needed to fulfill four different aspirations of the change enterprise are set forth in the following bar graph.